what is claimed is:

1. A method of improving the mechanical properties of a non-porous dielectric film on a partially fabricated integrated circuit while limiting shrinkage and limiting any increases in dielectric constant, the method comprising:

(a) providing the partially fabricated integrated circuit with its dense dielectric film;

(b) exposing the non-porous dielectric film to modulated UV radiation to thereby improve the mechanical properties of the non-porous dielectric film while limiting shrinkage and limiting any increases in dielectric constant; and

(c) forming one or more additional layers on the partially fabricated integrated circuit.

2. A method of claim 1, wherein the non-porous dielectric film comprises a silicon oxide.

3. The method of claim 1, wherein the non-porous dielectric film is a carbon-doped silicon oxide (CDO).

4. A method of claim 3, wherein the CDO film is a non-porous CDO film.

5. A method of claim 3, further comprising forming the non-porous dielectric film from a silane, silane derivative, siloxane, siloxane derivative or a combination thereof.

6. A method of claim 3, where the non-porous dielectric film is formed using PECVD techniques.

7. A method of claim 1, wherein the thickness of the non-porous dielectric film is between about 500 Angstroms and 5,000 Angstroms.

8. The method of claim 1, wherein the improved mechanical properties include improved hardness, modulus and cohesive strength of the non-porous dielectric film.

9. A method of claim 1, wherein the hardness of the non-porous dielectric film is increased by about 0.7 GPa or greater.

10. A method of claim 1, wherein the modulus of the non-porous dielectric film is increased by about 4.6 GPa or greater.

11. The method of claim 1, wherein the non-porous dielectric film shrinks by no more than about 10 % during (b).

12. A method of claim 1, wherein the dielectric constant of the non-porous dielectric film increases to no greater than about 1 % during (b).

13. The method of claim 1, wherein the modulated UV radiation has a period of between about 1μ seconds and 5 minutes.

14. The method of claim 1, wherein the modulated UV radiation has amplitude up to about 3 Watts/cm^2.

15. A method of claim 1, wherein the exposure of (b) occurs for a time period ranging between about 1 second and about 60 minutes.

16. The method of claim 1, wherein the modulated UV radiation has a duty cycle of between about 1% and 90%.

17. A method of improving the mechanical properties of a porous dielectric film on a partially fabricated integrated circuit while limiting shrinkage and limiting any increases in dielectric constant, the method comprising:

(a) providing the partially fabricated integrated circuit with its porous dielectric film;

(b) exposing the porous dielectric film to modulated UV radiation to thereby improve the mechanical properties of the porous dielectric film while limiting shrinkage and limiting any increases in dielectric constant; and

(c) forming one or more additional layers on the partially fabricated integrated circuit.

18. A method of claim 17, wherein the porous dielectric film comprises a silicon oxide.

19. The method of claim 17, wherein the porous dielectric film is a carbon-doped silicon oxide (CDO).

20. A method of claim 19, wherein the CDO film is a porous low-k CDO film.

21. A method of claim 3, further comprising forming the porous dielectric film from a silane, silane derivative, siloxane, siloxane derivative or a combination thereof.

22. A method of claim 19, where the porous dielectric film is produced by co-depositing a silicon-containing precursor and an organic porogen compound using PECVD methods.

23. A method of claim 22, wherein the silicon-containing precursor comprises at least one of a silane, silane derivative, siloxane or siloxane derivative and the organic porogen compound comprises a polyfunctional cyclic non-aromatic compound.

24. A method of claim 17, wherein the thickness of the porous dielectric film is between about 500 Angstroms and 5,000 Angstroms.

25. The method of claim 17, wherein the improved mechanical properties include improved hardness, modulus and cohesive strength of the porous dielectric film.

26. A method of claim 17, wherein the hardness of the porous dielectric film is increased by about 0.9 GPa or greater.

27. A method of claim 17, wherein the modulus of the porous dielectric film is increased by about 5.0 GPa or greater.

28. The method of claim 17, wherein the porous dielectric film shrinks by no more than about 25% and more preferably by no more than about 15% during (b).

29. A method of claim 17, wherein the dielectric constant of the porous dielectric film increases to no greater than about 8% during (b).

30. The method of claim 17, wherein the modulated UV radiation has a period of between about 1μ seconds and 5 minutes.

31. The method of claim 17, wherein the modulated UV radiation has amplitude up to about 3 $Watts/cm^2$.

32. A method of claim 1, wherein the exposure of (b) occurs for a time period ranging between about 1 second and about 60 minutes.

33. The method of claim 1, wherein the modulated UV radiation has a duty cycle of between about 1% and 90%.

34. A method of treating dielectric film on a substrate, the method comprising:

(a) exposing the dielectric film to ultraviolet radiation with a first light intensity during a first time increment;

(b) exposing the dielectric film to ultraviolet radiation with a second light intensity during a second time increment; and

(c) repeating (a) and (b) in a manner that provides modulated ultraviolet radiation exposure that significantly increases the hardness and modulus of the dielectric film.

35. A method of claim 34, wherein the dielectric film is a carbon-doped oxide (CDO) film.

36. A method of claim 35, wherein the carbon-doped oxide (CDO) film is a non-porous film.

37. A method of claim 35, wherein the carbon-doped oxide (CDO) film is a porous film.

38. A method of claim 36, wherein the hardness of the non-porous dielectric film is increased by about 0.7 GPa or greater.

39. A method of claim 37, wherein the hardness of the porous dielectric film is increased by about 0.9 GPa or greater.

40. A method of claim 36, wherein the modulus of the non-porous dielectric film is increased by about 4.6 GPa or greater.

41. A method of claim 37, wherein the modulus of the porous dielectric film is increased by about 5.0 GPa or greater.

42.. The method of claim 36, wherein the non-porous dielectric layer shrinks by no more than about 10 % and more preferably by no more than about 6% during the method.

43. The method of claim 37, wherein the porous dielectric film shrinks by no more than about 25 % and more preferably by no more than about 15% during the method.

44. A method of claim 36, wherein the dielectric constant of the non-porous dielectric film increases by no greater than about 1 % during the method.

45. A method of claim 37, wherein the dielectric constant of the porous dielectric film increases by no greater than about 8% during the method and more preferably by no greater than 4%.

46. A method of claim 34, wherein the first and second light intensities differ by a value up to about 3 W/cm^2.

47. A method of claim 34, wherein one of the first and second light intensities is about 0 W/cm^2.

48. A method of claim 34, wherein the ultraviolet radiation in (a), (b) and (c) is provided by a single ultraviolet radiation source.

49. A method of claim 34, wherein the ultraviolet radiation is provided by one or more sources modulated to provide modulated ultraviolet radiation.

50. A method of claim 49, wherein of the modulated ultraviolet radiation has a duty cycle ranging between about 1% and about 90%.

51. A method of claim 49, wherein the modulated ultraviolet radiation has a period of between about 1μ seconds and 5 minutes.

52. A method of claim 34, wherein the substrate exposure to ultraviolet radiation in (a), (b) and (c) occurs for a total time ranging between about 1 second and about 60 minutes.

53. A method of claim 34, wherein the ultraviolet radiation in (a), (b) and (c) comprises one or more wavelengths ranging between about 150nm and about 800nm.

54. A method of claim 34, wherein the ultraviolet radiation in (a), (b) and (c) comprises one or more wavelengths ranging between about 150nm and about 800nm.

55. A method of claim 34, wherein (a), (b) and (c) are performed at pressures ranging between about 1 μTorr and about 760 Torr (atmospheric pressure).

56. A method of claim 34, wherein a purge procedure is performed after (a) and before (b), after (b) and before (c), the purge procedure involving the use of one or more of Ar, He, N_2, CO_2, H_2, O_2, and C_2H_4.

57. A method of claim 34, wherein (a), (b) and (c) occur at a constant substrate temperature between about -10 and about 450 degrees.